QUADROTOR TOUR GUIDE

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Abstract

This poster describes an quadrotor built with projecting capabilities at the Robotics, Intelligent Sensing & Control (RISC) laboratory. A smart and autonomous quadrotor that can fly in a specified path. It has the ability to identify the QR code, scan it and pass the information to the android application. The android application will try to lookup the information related to the QR Code. And the projector mounted on the top of the drone will help in projecting the information.

Introduction

Mobile Navigating robots have been used as tour guide in museums and public places. In this work we try to implement a Quadrotor to give a tour of the engineering research projects at the school of engineering at UB tour guide.

A drone that can be used as a tour guide in different areas like Museum Tour Guide, Industrial Visit tour guide and it can be also used as advertisement promotions at particular events.

System and Hardware Design

Figure 1: Conceptual View of Quadrotor Tour Guide

For this project we used a A.R Parrot 2 power edition drone, it has a Parrot 6 ARM9 468 MHz processor and a navigation board, 40MHZ 16-bit microprocessor. On board it has a MEMS gyroscope, the Invensense IDG500, ROCm Atheros AR6102G-BM2D b/g Wi-Fi module and the USB/serial port. The ROCm Atheros creates drone's own Wi-Fi access point. The two large mesh cylinders make up the ultrasonic altimeter, which stabilize the quadrotor within 6 meters of the ground. Each DC brushless motor runs at 28,000 RPM when the drone is hovering, and as fast as 41,400 during full acceleration, this also helps the Quadrotor to have maximum payload.

QR CODE Implementation

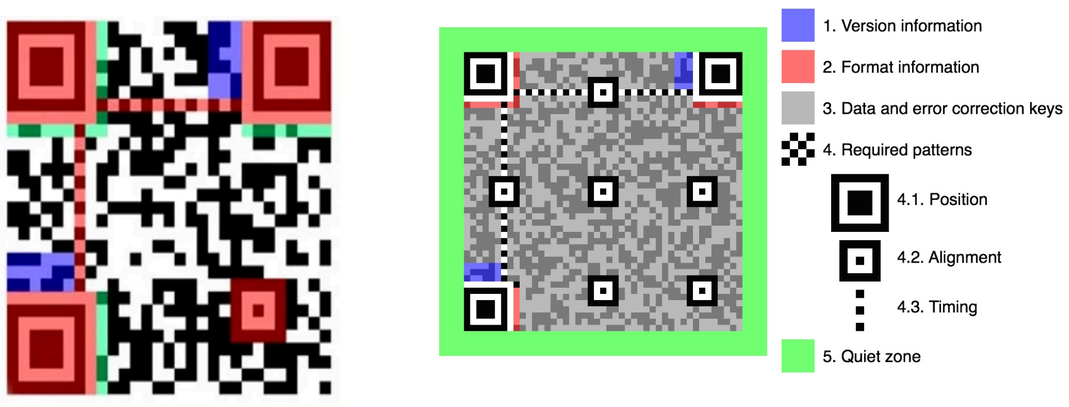

Figure 2: QR Code Mechanism

QR code abbreviated from **Quick Response Code**. A barcode is a machine-readable optical label that contains information about the item to which it is attached. QR codes are made up of black squares and white squares. Each of these squares is called a module. In every QR code, there are certain modules that must not be covered or edited, else the code won't scan. Figure 2 shows these features highlighted in different colors. The three large squares highlighted in red are the position markers, these tell the scanner where the edges of the code are.

Project Control Flow

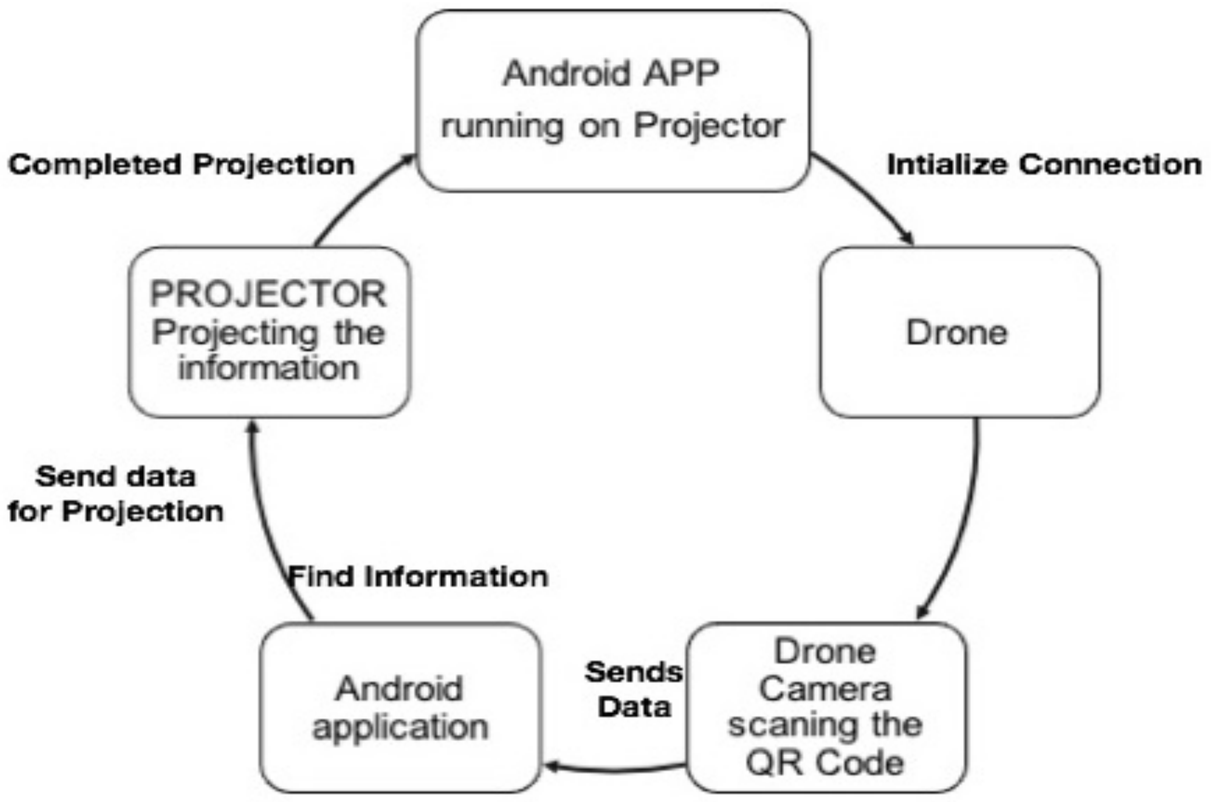

Figure 4: Flow Control

The Quadrotor will fly at a constant speed in an indoor environment, while flying it will scan to see if a QR code is present there. The scanned QR code information is sent to the android application running on the projector.

Once the android application gets the QR code information it will lookup the related repository for a video. This video can be stored online on a repository such as YouTube or Google Drive. Once it fetches the appropriate video, the android application will send the data to the projector to project it. On completion of the projection, the drone will continue with the specified flight path and will continue to look for other QR codes till it reaches the final destination.

Figure 3: Payload Testing

The figure 3 shows the experimental testing of the Quadrotor Payload Capacity. It hold maximum payload of 603.7 grams.

Results

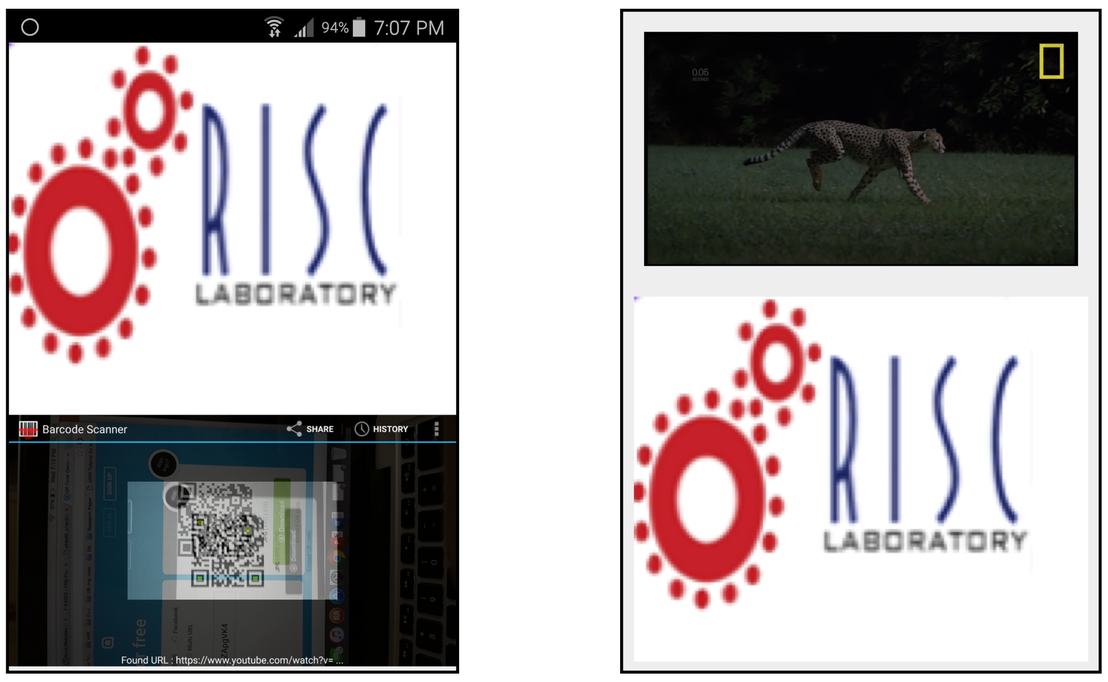

Figure 5: Android App Results

The figure 5 shows us how the Android application will take the Input i.e. (the QR Scan code), lookup for data related to the QR Code. On finding the data display it and the projector will project the data.

Conclusion

We have built quadrotor tour guide using AR Parrot drone and an Android projector. We used this to autonomous drone guide to successfully demo the research project posters in the school of engineering building at UB.

Future Directions

In the future, with the use of holographic projector, this quadrotor can be used for projecting 3-dimensional drawings and architectural designs. For example suppose a person is unavailable to fix a machine problem, then with the use of hologram projector he can access and project the machine drawings and virtually access the insides of the machine.